Economic Evaluation
Remaining Reserves of
Heath Steele Mines
(November, 1998)

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EXECUTIVE SUMMARY

DM Fraser Services Inc. was retained by the Province of New Brunswick, Department of Natural Resources and Energy (DNRE) to undertake an economic assessment of the remaining geological reserves at Heath Steele Mines. This assessment involved a review of any residual mineralized resources to determine the overall tonnage available followed by an economic evaluation to determine the feasibility of mining and processing any remaining mineralized resources.

Only 638,000 tonnes (36%) of the approximately 1.7 million tonnes of geological resource (proven and probable) in B Mine and C Mine is close or exceeds the basic mine economic NSR cut-off of $54.30 including the minimum rate of return. Of the 638,000 tonnes, about 462,000 tonnes (72%) was contained in Stope Blocks 62-99 and 59-03 (both contained in B Mine). When these blocks were evaluated in detail, they were found not to be economic when all necessary development was included. A zinc price of US$0.61 and copper price of US$0.75 is necessary to make these blocks economic at mill full production tonnage of 2,700 tonnes per day. Given the outlook for mineral prices during the next 2 years, these stope blocks are unlikely to become economic during that time. Even if these stope blocks were developed, they might not be in production before the remaining ore reserves are depleted at the mine. This would cause an ore production problem as the stope blocks could only produce 1,200-1,500 tonnes per day and would not meet the mill required feed rate of 2,700 per day. Four other alternatives were considered for production of these blocks but all will increase the operating cost and none are considered to be feasible.

After a limited review and discussion of the exploration potential around B Mine with the Chief Geologist, it appears that there are limited chances of adding significant economic reserves at the present time that would increase the life of the mine.

The expense of maintaining the shaft for potential later development of Stoping Blocks 62-99 and 59-03 will only add cost and raise the Net Smelter Return (NSR) minimum requirement to become economic. Carrying costs to keep the mine, mill and mine site on care and maintenance could exceed $1 million per month. Under a best case scenario where metal prices improve during the next 12 months to a point where the blocks become economic ($0.61/lb Zinc) and assuming the blocks could be mined at 2,700 tonnes per day starting before the last quarter of 1999, the mine life would only be extended by six months.

Table of Contents

1.0 INTRODUCTION 1

2.0 GEOLOGICAL RESOURCES 2

3.0 ECONOMIC EVALUATION 5

3.1 Assumptions 5
3.2 Economic Reserves 7
3.3 Scheduling 10

4.0 CONCLUSION 13

List of Tables

Table 1 - Geological Resources on October 28, 1998 3

Table 2 - Proven and Probable Geological Resources by Stope 4

Table 3 - Heath Steele Actual Concentrate Grades and Recoveries for 1998 5

Table 4 - Actual Operating Costs for Heath Steele YTD September 30 1998 5

Table 5 - Metal Price Forecast 6

Table 6 - Direct Operating Costs - Stope Block 62-99 & 59-03 7

Table 7 - Indirect Operating Costs - Stope Block 62-99 & 59-03 8

Table 8 - N.S.R. Calculation to Mine Gate - Stope Block 62-99 & 59-03 9

Table 9 - Total Cost Estimate of Trucking Ore to Brunswick for Processing 11

List of Figures

Figure 1 - Stope Blocks 62-99 and 59-03 Development Schedule 10

Figure 2 - LME Price for Zinc and Copper - June 1997 - October 1998 12

List of Appendices

APPENDIX 1 - Stope Net Smelter Return Calculations 14

APPENDIX 2 - Metal Prices Background 19

APPENDIX 3 - Certificate of Qualification 24

APPENDIX 4 - National Policy Statement No. 2-A Reserve Classification Definitions 26

1.0 INTRODUCTION

On October 22, 1998 DM Fraser Services Inc. was retained by the Province of New Brunswick, Department of Natural Resources and Energy (DNRE) to undertake an economic assessment of the remaining geological resources at Heath Steele Mines. This assessment involved a review of any residual mineralized resources to determine the overall tonnage available followed by an economic evaluation to determine the feasibility of mining and processing any remaining mineralized resources.

On October 26, 1998 Mac Fraser, of DM Fraser Services Inc., visited Heath Steele Mines to collect the necessary information to complete the evaluation. Discussions were held with Peter George, Superintendent of Engineering; Art Hamilton, Chief Geologist; Brian Dunnett, Senior Mine Planner; and Dick Cavalerro, Geological Consultant to Fracflow Consultants. Information gathered included:

1. mining and processing operating costs;
2. planning for blocks to be mined;
3. capital and development costs for the blocks to be mined;
4. necessary rate of return (Noranda corporate);
5. net smelter return (NSR) to the mine gate;
6. mill recoveries and grades;
7. geological resource tonnage and grade, by category (proven, probable, possible);
8. exploration potential to find additional economic resources.

Mac Fraser had been underground at Heath Steele Mines in 1996 to visit and observe operations in the C Mine. He did not go underground during this review.

This economic evaluation will use ***National Policy Statement No. 2-A*** as a guideline for resource calculation. ***National Policy Statement No. 2-A*** is a set of guidelines prepared by the Ontario Securities Commission to be used for all economic evaluations of mineral properties.

2.0 GEOLOGICAL RESOURCES

Definitions of proven, probable and possible resource categories are taken from National Policy Statement No. 2-A and are included in Appendix 4. National Policy Statement No. 2-A defines ore as *""Ore" means a natural aggregate of one or more minerals which, at a specific time and place, may be mined and sold at a profit, or from which some part may be profitably separated;"*. The notion of a profit or return must be included as part of the evaluation. The Policy also states that *"possible or inferred reserves must not be added to other categories of reserve and their inclusion is not acceptable in any economic analysis or feasibility study of a project"*. For this reason, any of the resources categorized as "possible" can not be included in this report.

This report will only deal with known geological resources at the B Mine and C Mine.

Table 1 is a summary of the geological resources at the B Mine and C Mine of Heath Steele Mines. The resource table was generated by Art Hamilton, Chief Geologist at Heath Steele and was reviewed by Mac Fraser. Mac Fraser's review agreed that the classification of resources by Heath Steele Mines fits National Policy Statement No. 2-A. *Dilution* factor is the percentage of waste or low grade rock which is unavoidably removed along with the ore in the mining process. Dilution will cause the ore tonnage to go up but the ore grade to go down. A *cut* factor is applied to assays so that high erratic values would not appreciably increase the over-all average. These values are generally gained through experience at a particular mine and are dependent on the mining method and the type of minerals mined. In Table 1 the dilution (%Dil) factor has been applied to the tonnage and the dilution and cut factor (%Dil&Cut) to the grade. The geological resources shown represent tonnages that are not included in the present mine production plan.

Table 1
Geological Resources on October 28, 1998

Proven and Probable Resources

Location	Tonnes	%Pb	%Zn	%Cu	g/T Ag	%Dil&Cut	%Dil
B Mine	1,521,672	1.30%	3.55%	1.77%	63.2	21.7%	13.0%
C Mine	206,835	1.48%	5.75%	0.84%	55.1	29.0%	13.0%
Total	**1,728,507**	**1.32%**	**3.81%**	**1.66%**	**62.2**	**22.6%**	**13.0%**

Possible Resources

Location	Tonnes	%Pb	%Zn	%Cu	g/T Ag	%Dil&Cut	%Dil
B Mine	780,022	1.50%	4.34%	1.66%	79.7	26.5%	13.0%
C Mine	546,859	2.86%	7.86%	0.63%	85.0	30.1%	13.0%
Total	**1,326,881**	**2.06%**	**5.79%**	**1.24%**	**81.9**	**28.0%**	**13.0%**

Table 2 is a breakdown of the proven and probable geological resources in Table 1. The above grades and tonnages in Table 1 agree with the diluted and cut grades in Table 2.

Table 2
Proven and Probable Geological Resources by Stope

C Mine

Stope	Undiluted					Diluted and Cut				% Dil&Cut	%Dil	Mine Recovery	Dil. Tonnes	Rec. Tonnes
	%Pb	%Zn	%Cu	g/T Ag	Tonnes	%Pb	%Zn	%Cu	g/T Ag					
87-108 (Crown Pillar)	3.54%	10.58%	0.28%	94.2	28,082	2.42%	8.14%	0.22%	72.5	30.0%	13.0%	87.0%	31,733	27,607
86-108 (Below 8700)	3.20%	9.59%	0.51%	78.2	15,517	2.19%	7.38%	0.39%	60.1	30.0%	13.0%	87.0%	17,534	15,255
83-99-2 Cu	0.05%	0.39%	3.49%	55.5	20,685	0.03%	0.30%	2.68%	42.7	30.0%	13.0%	87.0%	23,374	20,335
86-9450 Cu	0.09%	1.01%	3.68%	64.8	11,286	0.06%	0.78%	2.83%	49.8	30.0%	13.0%	87.0%	12,753	11,095
86-8500 Cu	0.19%	4.43%	3.75%	39.1	11,615	0.13%	3.41%	2.88%	30.1	30.0%	13.0%	87.0%	13,125	11,419
82-06-0	1.00%	6.91%	0.43%	51.7	23,729	0.70%	5.39%	0.33%	40.4	28.0%	13.0%	87.0%	26,814	23,328
87-108 Stope	2.99%	9.34%	0.22%	77.4	72,126	2.08%	7.29%	0.17%	60.4	28.0%	13.0%	87.0%	81,502	70,907
Total C Mine Prov/Prob	**2.14%**	**7.40%**	**1.09%**	**71.0**	**183,040**	**1.48%**	**5.75%**	**0.84%**	**55.1**	**29.0%**	**13.0%**	**87.0%**	**206,835**	**179,947**

B Mine

Stope	Undiluted					Diluted and Cut				% Dil&Cut	%Dil	Mine Recovery	Dil. Tonnes	Rec. Tonnes
	%Pb	%Zn	%Cu	g/T Ag	Tonnes	%Pb	%Zn	%Cu	g/T Ag					
Crown Pillar East (Cu)	1.17%	1.77%	3.57%	55.9	141,934	0.88%	1.50%	3.03%	47.4	18.0%	13.0%	87.0%	160,385	139,535
BLOCK 64	0.89%	2.54%	2.89%	39.6	81,416	0.66%	2.12%	2.41%	33.0	20.0%	13.0%	87.0%	92,000	80,040
BLOCK 47	1.24%	3.90%	1.77%	62.7	302,855	0.92%	3.25%	1.48%	52.3	20.0%	13.0%	87.0%	342,000	297,540
BLOCK 41	3.44%	8.39%	0.85%	113.1	40,507	2.49%	6.82%	0.69%	92.0	23.0%	13.0%	87.0%	45,773	39,822
85-98-1S	2.89%	7.53%	1.31%	92.8		2.06%	6.02%	1.05%	74.2	25.0%	13.0%	87.0%		
76-83 Cu UPPER	0.65%	1.71%	3.87%	49.4	10,153	0.45%	1.32%	2.98%	38.0	30.0%	13.0%	87.0%	11,473	9,981
76-83 Cu UC	1.38%	2.79%	3.78%	72.7	18,990	0.94%	2.28%	2.91%	55.9	30.0%	13.0%	87.0%	21,459	18,669
75-99625	0.22%	0.81%	4.37%	43.2	17,573	0.16%	0.66%	3.55%	35.1	23.0%	13.0%	87.0%	19,857	17,276
75-99075 UC	0.48%	1.18%	5.20%	77.8	10,776	0.33%	0.92%	4.06%	60.8	28.0%	13.0%	87.0%	12,177	10,594
75-82(S) UPPER	0.72%	2.30%	3.97%	90.2	8,166	0.49%	1.77%	3.05%	69.4	30.0%	13.0%	87.0%	9,250	8,048
75-82(S) UC	0.62%	2.10%	3.75%	78.5	8,157	0.45%	1.72%	3.07%	66.4	22.0%	13.0%	87.0%	9,217	8,019
74-99075 UC	0.39%	1.22%	3.55%	38.4	7,052	0.29%	1.01%	2.93%	31.7	21.0%	13.0%	87.0%	7,969	6,933
74-98475-2 UC	0.18%	0.48%	4.07%	26.4	10,793	0.13%	0.38%	3.18%	20.6	28.0%	13.0%	87.0%	12,196	10,611
74-98 N UPPER	0.49%	1.20%	4.51%	52.5		0.34%	0.94%	3.52%	41.0	28.0%	13.0%	87.0%		

B Mine (continued)

Stope	Undiluted					Diluted and Cut				% Dil&Cut	%Dil	Mine Recovery	Dil. Tonnes	Rec. Tonnes
	%Pb	%Zn	%Cu	g/T Ag	Tonnes	%Pb	%Zn	%Cu	g/T Ag					
74-98 N UC	0.31%	0.81%	4.80%	44.6		0.22%	0.63%	3.75%	34.8	26.0%	13.0%	87.0%		
74-83 S	1.02%	3.76%	3.34%	50.1	8,805	0.70%	2.89%	2.57%	38.5	30.0%	13.0%	87.0%	8,950	8,656
72-99375 UC	0.72%	2.05%	3.03%	60.3	5,040	0.55%	1.77%	2.61%	52.0	16.0%	13.0%	87.0%	5,695	4,955
72-99275 UC	1.66%	3.54%	2.38%	74.1	6,882	1.31%	3.13%	2.11%	65.5	13.0%	13.0%	87.0%	7,777	6,766
72-98825 UPPER	0.16%	0.66%	5.77%	32.2		0.11%	0.50%	4.34%	24.2	33.0%	13.0%	87.0%		
72-98825 UC	0.33%	0.87%	4.06%	35.7		0.22%	0.65%	3.05%	26.8	33.0%	13.0%	87.0%		
72-98575	0.18%	0.73%	3.12%	17.1	8,038	0.14%	0.62%	2.64%	14.5	18.0%	13.0%	87.0%	9,083	7,902
70-99375 UC	1.54%	3.36%	2.17%	67.2	13,078	1.18%	2.90%	1.87%	57.9	16.0%	13.0%	87.0%	14,778	12,657
70-99275 UPPER	0.48%	1.45%	2.67%	42.5	13,888	0.38%	1.28%	2.36%	37.8	13.0%	13.0%	87.0%	15,893	13,653
70-99275 UC	0.81%	1.32%	2.52%	48.0	6,009	0.64%	1.17%	2.23%	42.5	13.0%	13.0%	87.0%	6,790	5,907
70-99175 UPPER	0.33%	0.98%	3.54%	40.1	13,775	0.25%	0.83%	3.00%	34.0	18.0%	13.0%	87.0%	15,566	13,542
70-99175 UC	0.69%	1.46%	2.25%	43.9	2,766	0.52%	1.24%	1.91%	37.2	18.0%	13.0%	87.0%	3,126	2,719
70-99075 UC	0.71%	1.38%	3.81%	51.4		0.52%	1.14%	3.15%	42.5	21.0%	13.0%	87.0%		
68-99425 UC	1.42%	2.99%	2.50%	78.5	14,291	1.10%	2.60%	2.17%	68.3	15.0%	13.0%	87.0%	16,149	14,049
68-99375 UC	0.48%	1.38%	2.57%	46.6	6,003	0.38%	1.24%	2.32%	42.0	11.0%	13.0%	87.0%	6,763	5,902
68-98575	0.32%	0.85%	2.93%	30.2	12,891	0.24%	0.72%	2.48%	25.6	18.0%	13.0%	87.0%	14,567	12,673
68-95	2.25%	4.95%	1.74%	86.0	41,331	1.54%	3.81%	1.34%	67.7	30.0%	13.0%	87.0%	46,704	40,633
66-98675 UC	0.30%	0.91%	3.22%	29.5	20,198	0.23%	0.77%	2.73%	25.0	18.0%	13.0%	87.0%	22,824	19,857
66-98625 UPPER	0.22%	0.69%	2.35%	22.6	41,597	0.17%	0.59%	2.03%	19.5	16.0%	13.0%	87.0%	47,005	40,894
66-98625 UC	0.14%	0.65%	1.89%	20.2	12,125	0.11%	0.56%	1.63%	17.4	16.0%	13.0%	87.0%	13,701	11,920
66-98575 UPPER	0.15%	0.58%	2.99%	27.1	19,206	0.11%	0.49%	2.53%	23.0	18.0%	13.0%	87.0%	21,703	18,681
65-99 Overcut & Upper u/c	0.93%	2.35%	2.73%	29.6	20,456	0.69%	1.96%	2.28%	49.2	20.0%	13.0%	87.0%	23,115	20,110
65-98775 Upper	0.30%	0.57%	3.34%	22.631.5	7,347	0.23%	0.48%	2.83%	26.7	18.0%	13.0%	87.0%	8,302	7,223
65-98775 UC	0.23%	0.22%	3.61%	26.1	4,767	0.16%	0.17%	2.82%	20.4	28.0%	13.0%	87.0%	5,387	4,686
62-99	3.31%	7.90%	1.13%	128.5	289,956	2.36%	6.32%	0.90%	102.8	25.0%	13.0%	87.0%	327,650	285,056
59-03	3.48%	7.63%	1.21%	116.1	119,972	2.47%	6.10%	0.97%	92.9	25.0%	13.0%	87.0%	135,568	117,944
Total B Mine Prov/Prob	**1.79%**	**4.37%**	**2.14%**	**77.6**	**1,346,613**	**1.30%**	**3.55%**	**1.77%**	**63.2**	**21.7%**	**13.0%**	**87.0%**	**1,521,672**	**1,323,855**

3.0 ECONOMIC EVALUATION

3.1 Assumptions

The following assumptions have been made for this review:

1. Mill recoveries and concentrate grades will be the same as achieved to-date in 1998. Table 3 shows Heath Steele actual results to-date for 1998.

Table 3
Heath Steele Actual Concentrate Grades and Recoveries for 1998

	Zinc	Lead	Copper	Silver
Grade	52.11%	42.89%	22.21%	-
Recovery	82.00%	35.00%	66.00%	33.90%

2. Mill, maintenance and administrative costs will be the same as achieved to-date in 1998. Actual 1998 cost to September 30 are shown in Table 4.

Table 4
Actual Operating Costs for Heath Steele YTD September 30 1998

Area	Cost $/tonne	Description
Mine	19.85	Mine operating
Mill	13.67	Mill operating
Maintenance	9.80	Mine/Mill maintenance
Administrative	5.05	Admin/staff/corp staff
Incentive	0.06	Incentive program
Total	48.48	Total operating cost

3. Smelter terms will be the same as 1998. These are included in the Net Smelter Return (NSR) Model provided to DM Fraser Services by the Superintendent of Engineering. The NSR calculation includes cost of transportation from the mine (referred to as mine gate), handling, smelting, refining, weighing, sampling, assaying, (ocean freight if required), sales commissions and insurance. There are penalties for such items as too much iron (pyrite) in the zinc concentrate and too much lead in the copper concentrate.
4. Noranda's minimum 12% rate of return (corporate objective) must be achieved on all production. This will be shown as a 12% margin on production cost and capital.
5. Mine ore recovery factor ranges between 85% and 94%. In the geological resource calculations, a factor of 87% has been used.

Noranda's Capital Investment $85 M

6. A temporary mine shutdown will cost $0.9-1.5 million per month based on 1985/86 experience.
7. An Exchange Rate of $1.43 Cdn = $1.00 US will be used (see details Appendix 2). Heath Steele has hedged the currency exchange at $1.43 for 1999.
8. Table 5 shows metal prices used in this evaluation (see details Appendix 2).

Table 5
Metal Price Forecast

Product	1998	1999	2000	2001	2002
Zinc ($US/lb)	0.47	0.54	0.55	0.55	0.55
Copper ($US/lb)	0.75	0.75	0.72	0.74	0.78
Lead ($US/lb)	0.24	0.23	0.25	0.26	0.27
Silver ($US/oz)	5.00	5.25	5.50	5.75	6.00

3.2 Economic Reserves

Given the above operating costs and corporate rate of return requirement, a geological resource after dilution and cutting must have a Net Smelter Return of $54.30 ($48.48*1.12) per tonne to the mine gate to be considered economic (before considering capital). Under current metal price conditions, of the proven and probable geological resources not in the present mining plan, only Stope Blocks 62-99 and 59-03 come close to the requirement (see Table 8). A complete list of the NSR by stope block is shown in Appendix 1.

These two stope blocks will be evaluated in detail for cost and scheduling from development to production. With the above assumptions, it is only necessary to review mine operating and new capital costs to develop the new zones (Table 6 and Table 7).

Table 6
Direct Operating Costs
Stope Block 62-99 & 59-03

Stope Development Costs			
Trackless Drifts and Cross Cuts	5,485 ft	$350/ft	$1,919,750
Raises (Conventional)	680 ft	$140/ft	$95,200
Raises Alimak	640 ft	$220/ft	$140,800
Declines (4.0x5.0m arched)	3,450 ft	$330/ft	$1,138,500
Total Stope Development			**$3,294,250**
Blast Hole Drilling			
Blast Hole Drilling (4 in Dia.)	39,500 ft	$4.50/ft	$177,750
Hole Drilling (2 ½ in Dia.)	49,500 ft	$2.50/ft	$123,750
Total Blast Hole Drilling			**$301,500**
Blast Hole Blasting			
DTH Blasting	39,500 ft	$8.80/ft	$347,600
Hole Blasting	49,500 ft	$4.50/ft	$222,750
Total Blast Hole Blasting			**$570,350**
Mucking and Tramming			
Haul Distance (6 yd scoop + 2x426 trucks)	2,700 ft	414 t/shift	
Tonnes Hauled	403,000 t	$3.50/t	**$1,410,500**
Total Tramming Cost			
Ventilation Requirements (210,000 cfm)			
Ventilation Raise (Fresh Air 14ftx7ft plus rehab drift)	750 ft	$650/ft	$487,500
Ventilation (Exhaust 14ftx7ft plus rehab drift)	600 ft	$650/ft	$390,000
Booster fans and Construction, Electrical			$105,000
Total Ventilation			**$982,500**
Misc (Shaft Pipe Repair)			**$20,000**
Total Direct Costs			**$6,579,100**
Total Direct Mining Cost per Tonne			**$16.33**

6.5 M"
403,000 t

Because of ground problems in the area around the sill pillar above Stope Block 62-99 the sill pillar may have to be increased from 20 metres to 35 metres for ground stability. This will reduce the recoverable tonnes and increase the total direct mining cost per tonne.

Table 7
Indirect Operating Costs
Stope Block 62-99 & 59-03

General Mine Costs (Actual - applicable to all ore tonnes)	
Fill-in Diamond Drilling	$0.99/t
Roadway Maintenance	$0.20/t
Crushing and Conveying	$0.36/t
Hoist Cage and Material Handling	$0.93/t
Shaft Maintenance	$0.33/t
Surface Waste Haulage	$0.17/t
Misc. Ground Support	$0.48/t
Orepass, chute and dump maintenance	$0.17/t
Construction Ventilation	$0.30/t
Ventilation (Propane and Fan)	$0.46/t
Air and Water Maintenance	$0.10/t
Surface Ore Rehandling	$0.56/t
Dry, Lamps and First Aid Supplies	$0.13/t
Electricity, Electrical and Heating	$2.15/t
Pumping and Drainage	$0.58/t
Surface Haulroad Maintenance	$0.08/t
Permits and Licenses	$0.05/t
Mine Rescue and Fire Protection	$0.05/t
Mine Administration and Training	$0.54/t
Mine Engineering and Geology	$0.57/t
Total Mine Indirect and Overhead Costs Per tonne Ore	**$9.20**
Total Direct Mining Cost per tonne Ore	$16.33
Total Mining Costs per tonne Ore	**$25.53**
Total Mill Costs per tonne Ore	$13.67/t
Maintenance	$9.80/t
Corporate Administration and Incentive	$5.11/t
Total Cost	**$54.11**
Required Minimum Return (12%)	*$6.49*
Total Cost Ore (including Minimum Rate of Return)	***$60.60***

Table 8 is the Net Smelter Return calculation for Stope Block 62-99 and 59-03 (details of each stope individually is included in Appendix 1) from the Heath Steele model:

Table 8
N.S.R. Calculation to Mine Gate

Stope Blocks 62-99 and 59-03

	Pb %	Zn %	Cu %	Ag in Pb	Ag in Cu
Head Grades (% - Ag in g/t)	2.39	6.29	0.92	99.90	
Recoveries	35.00%	82.00%	66.00%	16.57%	17.33%
Metal Prices US $	$0.25	$0.54	$0.75	$5.00	$300
Exchange Rate	$1.43				
Conc Grades	%	%	%	g/t	Au in g/t
Zn Conc		52.11			
Pb Conc	42.89			849	
Cu Conc	4.75		22.21	633	
N.S.R.	***($0.04)***	***$41.73***	***$6.65***	***$6.28***	
Total N.S.R. per t of ore	**$54.61**				

The total cost of mining the stope blocks (including minimum return) is $60.60 and the NSR to the mine gate is $54.61. The blocks are not economically feasible.

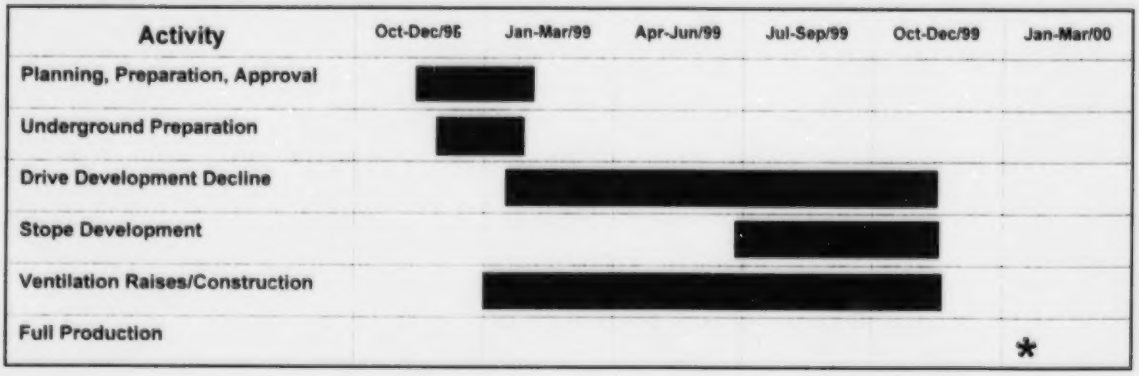
NOTED AS WRITTEN 4:5-9/05

3.3 Scheduling

Even if the Stope Blocks 62-99 and 59-03 were economically feasible to mine and preparation to complete development could be started today, there might be scheduling problems in developing the stope blocks and additional costs if the blocks were mined after the remaining ore reserves in the mine plan. These two stope blocks only represent six months of production at 2,700 tonnes per day.

To develop Stope Blocks 62-99 and 59-03, the critical path to get to production will run through development of the decline and stope haulage levels. Although one stope can be developed before the decline reaches the first main haulage drift, it only contains 20,000 tonnes. Approximately 2,300 feet of arched drifting 4.0x5.0m must be developed to get to the first main haulage drift. This will take approximately 10 months at 250 ft per month which is the average development per month for the mine. Even at this rate of development, men and equipment will have to be moved to this area to facilitate the development at the cost of development in other areas. In addition 1-3 months will be required to complete planning and get head office approval to do the development. The following chart shows the schedule for development.

Figure 1 - Stope Blocks 62-99 and 59-03 Development Schedule



This schedule creates a problem in that the development will be completed very close to the end of the life of the other existing ore resources scheduled to be mined at Heath Steele Mines. Ore reserves in the present mine plan will be exhausted between September 30 and December 31, 1999. Under best circumstances the ore from Stope Blocks 62-99 and 59-03 would not begin to be produced at capacity until at least November, 1999. Any delays after the other ore is depleted will cost in excess of $1 million per month in standby charges which will have to be absorbed by the tonnage ($2.50 per tonne per month).

A second problem is created at that time because these blocks will not generate enough ore to feed the mill by themselves. At best these blocks could generate 1,200-1,500 tonnes per day with 3 trucks and one scoop. There would also be a development crew working in the same area with a truck and a scoop. The haulage ways will be congested

and dangerous. The 2,500 foot haul is a long haul up a 15% grade to the dump point.

Alternatively the mill could be run on one line at 1,350 tonnes per day rather than 2,700 tonnes per day. Typically when tonnage is reduced by ½, the costs per tonne will increase by 30-40% per tonne.

A second alternative would be to operate the mill in a batch mode at full capacity. The downside is that recoveries drop, operating and maintenance costs increase and there are additional standby costs for power, pumping, etc.

The third alternative is to find additional ore reserves to supplement the tonnage from these blocks. The target would be approximately 500,000 tonnes of ore which met economic requirements (ie NSR exceeds total costs plus minimum rate of return). Additional tonnage through the mill could affect the closure planning and exceed tailings capacity, causing significant additional costs. There are no proven or probable ore reserves that would meet this target at the present time in B Mine or C Mine.

The fourth option would be to close the mill at Heath Steele and truck the ore to Brunswick Mining for processing at the Brunswick mill. There would be some capital requirements at the truck dump at Brunswick plus an additional trucking cost of about $5.50 per tonne to haul the ore to Brunswick (22 miles @ $0.25/tonne mile). Mill costs at Brunswick are about the same as Heath Steele ($13-14 per tonne). Table 9 is an estimate of the total cost of this option.

Table 9
Total Cost Estimate of Trucking Ore to Brunswick for Processing

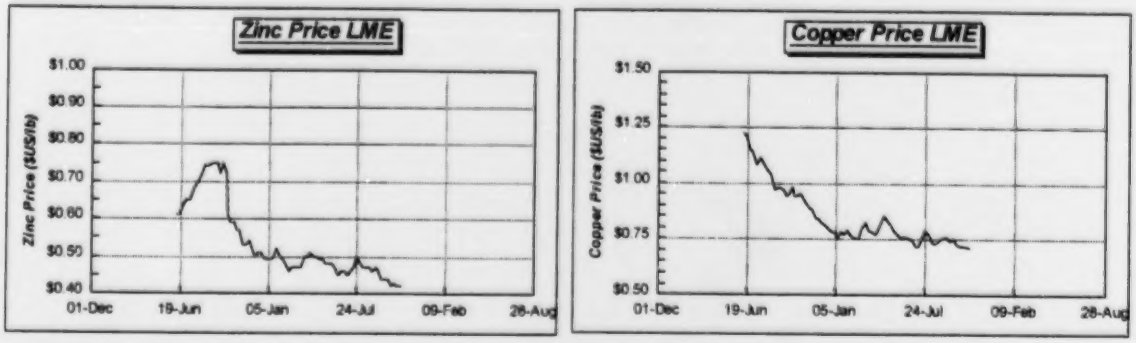
Total Mining Costs per tonne	25.53
Total Mill Costs per tonne plus transportation to BM&S	19.17
Maintenance	9.80
Corporate Administration and Incentive	5.11
Total Cost	**59.61**
Required Minimum Return (12%)	7.15
Total Cost plus Profit Target	***66.76***

The cost of all of these options will exceed $60.60 per tonne of ore mined when all operating and capital costs and a return are included. Under any scenario, the blocks do not appear to be economic.

The decision to stop the development of the decline and development of the Stope Blocks 62-99 and 59-03 was made at the end of the 4th quarter of 1997. Figure 2 show the London Metal Exchange prices for zinc and copper during the last 17 months. At the time the decision to stop the decline was made, the zinc price was about $0.50 per pound and copper was about $0.75 per pound. The NSR for Stope Blocks 62-99 and 59-03 was $50.91 at that time. The blocks were not feasible. The decision to stop the decline was

appropriate.

Figure 2 - LME Price for Zinc and Copper - June 1997 - October 1998



4.0 CONCLUSION

Only 638,000 tonnes (36%) of the approximately 1.7 million tonnes of geological resource (proven and probable) shown in Table 1 in B Mine and C Mine is close or exceeds the basic mine economic NSR cut-off of $54.30 including the minimum rate of return. Of the 638,000 tonnes, about 462,000 tonnes (72%) was contained in Stope Blocks 62-99 and 59-03 (both contained in B Mine). When these blocks were evaluated in detail, they were found not to be economic when all necessary development was included. A zinc price of US$0.61 and copper price of US$0.75 is necessary to make these blocks economic at mill full production tonnage of 2,700 tonnes per day. Given the outlook for mineral prices during the next 2 years, these stope blocks are unlikely to become economic during that time. Even if these stope blocks were developed, they might not be in production before the remaining ore reserves are depleted at the mine. This would cause an ore production problem as the stope blocks could only produce 1,200-1,500 tonnes per day and would not meet the mill required feed rate of 2,700 per day. Four other alternatives were considered for production of these blocks but all will increase the operating cost and none are considered to be feasible.

A detailed evaluation of Stope Block 86-108 and 87-108 (C Mine) was not completed (contained 131,000 tonnes of the 638,000 tonnes (20.5%)). The significant amount of development required (approximately 2,600 ft) with much less tonnage than Stope Blocks 62-99 and 59-03 would suggest that the operating cost per tonne of these stopes exceed $60.00 per tonne and will also not be economic during the next two years.

A detailed evaluation of the exploration potential at Heath Steele was not completed during this review. But after a limited review and discussion of the exploration potential around B Mine with the Chief Geologist, it appears that there are limited chances of adding significant economic reserves at the present time that would increase the life of the mine.

The expense of maintaining the shaft for potential later development of Stoping Blocks 62-99 and 59-03 will only add cost and raise the NSR minimum requirement to become economic. Carrying costs to keep the mine, mill and mine site on care and maintenance could exceed $1 million per month. Under a best case scenario where metal prices improve during the next 12 months to a point where the blocks become economic ($0.61/lb Zinc) and assuming the blocks could be mined at 2,700 tonnes per day starting before the last quarter of 1999, the mine life would only be extended by six months.

APPENDIX 1

Heath Steele Mines Review

Stope Net Smelter Return Calculations

November, 1998

NSR Calculations for Proven & Probable Geological Resources by Stope

C Mine

Stope	%Pb	%Zn	%Cu	g/T Ag	Dil. Tonnes	Rec. Tonnes	NSR $/t	Economic	To Be Mined
87-108 (Crown Pillar)	2.42%	8.14%	0.22%	72.5	31,733	27,607	60.08	N	N
86-108 (Below 8700)	2.19%	7.38%	0.39%	60.1	17,534	15,255	55.44	N	N
83-99-2 Cu	0.03%	0.30%	2.68%	42.7	23,374	20,335	23.70	N	N
86-9450 Cu	0.06%	0.78%	2.83%	49.8	12,753	11,095	28.41	N	N
86-8500 Cu	0.13%	3.41%	2.88%	30.1	13,125	11,419	44.91	N	N
82-06-0	0.70%	5.39%	0.33%	40.4	26,814	23,328	40.71	N	N
87-108 Stope	2.08%	7.29%	0.17%	60.4	81,502	70,907	53.32	N	N
Total C Mine Prov/Prob	1.48%	5.75%	0.84%	55.1	206,835	179,947	47.58	N	

B Mine

Stope	%Pb	%Zn	%Cu	g/T Ag	Dil. Tonnes	Rec. Tonnes	NSR $/t	Economic	To Be Mined
Crown Pillar East (Cu)	0.88%	1.50%	3.03%	47.4	160,385	139,535	34.39	N	N
BLOCK 64	0.66%	2.12%	2.41%	33.0	92,000	80,040	33.20	N	N
BLOCK 47	0.92%	3.25%	1.48%	52.3	342,000	297,540	35.41	N	N
BLOCK 41	2.49%	6.82%	0.69%	92.0	45,773	39,822	55.95	N	N
85-98-1S	2.06%	6.02%	1.05%	74.2					Y
76-83 Cu UPPER	0.45%	1.32%	2.98%	38.0	11,473	9,981	32.26	N	N
76-83 Cu UC	0.94%	2.28%	2.91%	55.9	21,459	18,669	39.28	N	N
75-99625	0.16%	0.66%	3.55%	35.1	19,857	17,276	31.70	N	N
75-99075 UC	0.33%	0.92%	4.06%	60.8	12,177	10,594	38.69	N	N
75-82(S) UPPER	0.49%	1.77%	3.05%	69.4	9,250	8,048	37.80	N	N
75-82(S) UC	0.45%	1.72%	3.07%	66.4	9,217	8,019	37.41	N	N
74-99075 UC	0.29%	1.01%	2.93%	31.7	7,969	6,933	29.44	N	N
74-98475-2 UC	0.13%	0.38%	3.18%	20.6	12,196	10,611	26.60	N	N
74-98 N UPPER	0.34%	0.94%	3.52%	41.0					N
74-98 N UC	0.22%	0.63%	3.75%	34.8					N
74-83 S	0.70%	2.89%	2.57%	38.5	8,950	8,656	39.80	N	N
72-99375 UC	0.55%	1.77%	2.61%	52.0	5,695	4,955	33.56	N	N
72-99275 UC	1.31%	3.13%	2.11%	65.5	7,777	6,766	39.88	N	N
72-98825 UPPER	0.11%	0.50%	4.34%	24.2					N
72-98825 UC	0.22%	0.65%	3.05%	26.8					N
72-98575	0.14%	0.62%	2.64%	14.5	9,083	7,902	23.69	N	N
70-99375 UC	1.18%	2.90%	1.87%	57.9	14,778	12,657	36.17	N	N
70-99275 UPPER	0.38%	1.28%	2.36%	37.8	15,893	13,653	27.62	N	N
70-99275 UC	0.64%	1.17%	2.23%	42.5	6,790	5,907	26.27	N	N
70-99175 UPPER	0.25%	0.83%	3.00%	34.0	15,566	13,542	28.89	N	N
70-99175 UC	0.52%	1.24%	1.91%	37.2	3,126	2,719	24.15	N	N

B Mine (Continued

Stope	%Pb	%Zn	%Cu	g/T Ag	Dil. Tonnes	Rec. Tonnes	NSR $/t	Economic	To Be Mined
70-99075 UC	0.52%	1.14%	3.15%	42.5					N
68-99425 UC	1.10%	2.60%	2.17%	68.3	16,149	14,049	37.02	N	N
68-99375 UC	0.38%	1.24%	2.32%	42.0	6,763	5,902	27.35	N	N
68-98575	0.24%	0.72%	2.48%	25.6	14,567	12,673	23.96	N	N
68-95	1.54%	3.81%	1.34%	67.7	46,704	40,633	39.08	N	N
66-98675 UC	0.23%	0.77%	2.73%	25.0	22,824	19,857	26.01	N	N
66-98625 UPPER	0.17%	0.59%	2.03%	19.5	47,005	40,894	19.53	N	N
66-98625 UC	0.11%	0.56%	1.63%	17.4	13,701	11,920	16.37	N	N
66-98575 UPPER	0.11%	0.49%	2.53%	23.0	21,703	18,681	22.61	N	N
65-99 Overcut & Upper	0.69%	1.96%	2.28%	49.2	23,115	20,110	32.31	N	N
65-98775 Upper	0.23%	0.48%	2.83%	26.7	8,302	7,223	24.90	N	N
65-98775 UC	0.16%	0.17%	2.82%	20.4	5,387	4,686	22.36	N	N
62-99	2.36%	6.32%	0.90%	102.8	327,650	285,056	54.83	N	N
59-03	2.47%	6.10%	0.97%	92.9	135,568	117,944	53.22	N	N
Total B Mine Prov/Prob	**1.30%**	**3.55%**	**1.77%**	**63.2**	**1,521,672**	**1,323,855**	**40.12**	**N**	

i would suggest a lot of development work (cost)

Additional Notes:

(C Mine) - Stopes 87-108 (Crown Pillar), 87-108 (Below 8700) and 87-108 Stope (total 113,769 recoverable tonnes) requires about 2,600 feet of development and will cross a fault which is expected to cause mining problems. The cost hurdle for these resources is expected to be above $60 considering the amount of development for the tonnage recoverable.

(B Mine) - Block 41 is close to surface which could cause mining problems and also requires a lot of development for 39,822 tonnes recoverable. The cost hurdle for these resources is expected to be above $60 considering the amount of development for the tonnage recoverable.

(B Mine) - Stope Blocks 62-99 and 59-03 are discussed in detail in the main body of the report.

NSR Indication for Possible Geological Resources by Stope

C Mine

Stope	%Pb	%Zn	%Cu	g/T Ag	Dil. Tonnes	Rec. Tonnes	NSR $/t	Econimic	To Be Mined
Porphyry Zone (G.A.)	4.90%	5.72%	0.14%	140.4	139,139	121,051	47.67	N	N
79-102-5N	2.22%	9.52%	0.12%	50.2	99,923	86,938	67.06	?	N
77-97-2N	1.46%	11.38	0.28%	39.6	168,155	146,295	79.93	?	N
83-03-5N (Prev 82-06-	5.08%	9.30%	0.38%	196.6	60,203	52,377	76.88	?	N
83-05-8N	1.68%	6.51%	0.47%	55.8					N
86-9550 Cu	0.23%	0.95%	3.35%	73.1	9,064	7,885	34.71	N	N
8400-8800 S Cu	0.29%	2.61%	2.32%	70.7	7,059	6,141	38.33	N	N
8400-8800 N Cu	0.14%	0.53%	3.83%	46.8	8,821	7,693	33.57	N	N
8800-8700 Cu	0.06%	0.29%	2.93%	22.7	7,693	6,693	24.08	N	N
8750-8750 Cu	0.13%	0.66%	2.73%	30.6	5,374	4,676	25.65	N	N
8850-8700 Cu	0.10%	0.62%	3.79%	30.7	11,312	9,842	32.83	N	N
8700-8700 UC Cu	0.05%	0.62%	3.35%	39.1	12,933	11,252	30.29	N	N
8700-8700 UPPER Cu	0.02%	0.10%	2.17%	16.4	8,072	7,022	17.06	N	N
87-95-4 Cu	0.17%	2.84%	2.19%	59.7	9,111	7,926	38.22	N	N
Total C Mine Possible	**2.68%**	**7.86%**	**0.63%**	**85.0**	**546,859**	**475,767**	**61.93**	**N**	

B Mine

Stope	%Pb	%Zn	%Cu	g/T Ag	Dil. Tonnes	Rec. Tonnes	NSR $/t	Economic	To Be Mined
70-01 South Lens	0.46%	1.54%	2.30%	46.3	51,104	44,461	29.48	N	N
64-05-5N	2.30%	5.67%	1.33%	82.2	113,384	98,644	52.21	N	N
65-02	0.93%	3.39%	1.54%	61.0	91,206	79,349	37.34	N	N
57-06	1.53%	4.49%	1.69%	85.7	524,328	456,165	47.27	N	N
Total B Mine Possible	**1.50%**	**4.34%**	**1.66%**	**79.7**	**788,022**	**678,619**	**45.67**	**N**	

Additional Notes:

(C Mine) - Porphyry Zone (G.A.), 79-102-5N, 77-97-2N, 83-03-5N (total 406,661 recoverable tonnes of which 285,610 potentially economic recoverable tonnes) requires about 600 feet of ramping and the stope widths are narrow (<15 feet). These areas represent possible ore and tend to be rich pockets with no appreciable tonnage. Narrow widths require a lot of development per tonne recovered.

(B Mine) - Stope block 64-05-5N (total 98,644 recoverable tonnes) requires about 700 feet of development and has narrow mining width. Narrow widths require a lot of development per tonne recovered.

APPENDIX 2

Heath Steele Mines Review

Metal Prices Background

November, 1998

METAL PRICES

Introduction

The following sections are included as background on the choices of metal prices and exchange rates for the economic evaluation of Heath Steele remaining geological resources. Prices and exchange rates are difficult to predict, especially in the unstable economic environment we are presently experiencing. I have chosen to use the ***U.S. Geological Survey - Minerals Information*** and ***NRCanada - 1997 Annual Review*** for basic mineral information and some pricing. These sources are typically quite accurate. I have chosen to use ***BANK OF MONTREAL*** exchange rate predictions as I have found them to be the most objective and accurate over the past 7 years. ***BANK OF MONTREAL - Economics Department - Metals - March 1998*** provided a very good review of copper which I have chosen to use as the basis for copper pricing. For an Asian projection of near-term future metal prices I have chosen to use Australian JB Were and Sons. The Asian market demand has a significant impact on metal prices given the present world capacity and thus the Asian perspective should have the most weighting in the short-term.

METAL PRICE OVERVIEW - Asian Perspective

SYDNEY, July 21, 1998: Australian stockbroker JB Were & Son has lowered its price forecasts for major base metals and predicted copper will continue to average less than 80 US cents a pound through 1999.In its quarterly commodities focus report, Were said it now expected **copper** to average only 79 US cents/lb this year and 78 cents in 1999, versus an earlier forecast of 81 and 79 cents respectively. The metal currently fetches about 77 cents/lb, with the revisions reflecting expectations of a "substantial surplus" in supply and a weakness in "metal sentiment". "We expect the market to remain in substantial surplus this year and next, but our base case shows the Western copper market returning to balance as soon as 2000," Were said.

Zinc prices also are seen taking a bigger tumble. This year zinc, a key alloy in galvanised steelmaking, should average 51 US cents/lb, down from 53 cents in Were's last forecast. The 1999 average forecast price of 54 cents has been revised down from 57 cents. Zinc prices averaged only 48.5 cents/lb in the first five months of this year. "The zinc price has performed poorly this year, caught in the tide of fund selling, which has adversely affected most commodities," Were said.

Expectations for leads performance over the next few years has deteriorated as supplies move deeper in surplus, Were said. Demand from the important vehicle battery-making sector has waned, leaving plenty of metal on the ground. **Lead** should average 24 US cents/lb this year and 23 cents in 1999, versus 25 cents and 24 cents respectively. "The season of peak demand is over now, stockpiles are stagnating for the time being, but with mine production and primary refined output set to grow strongly this year, inventories look certain to build in the second half. This leaves the lead market looking rather vulnerable," Were said.

ZINC

By 2000, the world mine production is forecast to increase by almost 1.4 million tons, about one-third of which is to come from Australia. This additional production should come from new mines at Century, Cannington, and Blendecale and, to a lesser extent, from expanded production of the existing Elura and Roseberry Mines. Australia's share of world production should increase from 18% in 1995 to 29% by 2000. This increased mine production may create an excess of concentrates into the next century, because expansion of smelter capacity will likely lag behind concentrate production. By the end of 1996, only one new smelter had been approved—the 170,000-ton smelter in Townsville, Australia. Production at this Korea Zinc-built smelter should start in October 1999. If needed, the best chance for additional smelting capacity could come from expansion of the existing smelters and the proposed 220,000-ton Gencor smelter in South Africa. Even if all these capacities should be brought on-stream, it would not affect the zinc market until about the year of 2000. - ***U.S. Geological Survey - Minerals Information***

The world's mine production of zinc is forecast to reach 7 600 000 t in 1998, an increase of 6% over 1997 due to new mine openings in Ireland and Australia, and expansions in the United States and India. World

zinc metal production is expected to total 7 900 000 t, an increase of 2.3% over 1997 and slightly more than 1998 metal consumption. However, when U.S. stockpile sales are included, a zinc metal surplus of 60 000 t is forecast for 1998. Surplus zinc in the Western World is expected to be higher, but that will depend on Chinese export levels, which will be determined by domestic demand and prices, the value of the Chinese yuan, and demand levels in other Asian countries as a result of the current currency crisis. With an expected small zinc metal surplus in 1998, any further fall in LME zinc stocks during the year will likely be modest. The price of zinc is therefore predicted to remain in the US50¢-55¢/lb range for the first half of the year, before rising in the second half as a result of rebounding demand in Asia; it is forecast to average US58¢/lb for 1998. Beyond 1998, investments made in the zinc industry in recent years will result in large increases in mine and smelter capacity near the turn of the century. This situation, combined with a cyclical economic downturn, is expected to lead to weakening zinc prices in the first few years of the next decade, followed by a gradual rise through to 2005. Prices are forecast to range between US49¢ and 57¢/lb (in constant 1997 cents) during this period. - ***NRCanada - 1997 Annual Review*** I have chosen to use:

Product	1998	1999	2000	2001	2002
Zinc ($US/lb)	0.47	0.54	0.55	0.55	0.55

Noranda is predicting a price of $0.45 for 1999 but given analysis by JB Were and the fact that LME inventories have been decreasing during the last 5 months, I have chosen to use a zinc price $0.54/lb for 1999. Given the significant increase in new production from Australia in 2000, I have chosen to keep the price flat after 2000. Zinc price has historically averaged $0.53-$0.55/lb in 1997 constant dollars. Ihave chosen a price of $0.55 after 1999. The zinc price has the largest impact on the NSR for Heath Steele resources.

SILVER

PRICES

The large build-up in stocks that occurred in the 1980s because of oversupply from by-product production placed downward pressure on prices, which bottomed out in 1992 resulting in a 19-year low in the average annual price. The average annual London Silver Market spot price for 1992 was US$3.95/oz. Subsequently, as stocks were drawn down in response to the supply deficit between 1992 and 1997, the price rose to a nine-year high of US$6.27/oz on December 24, 1997.

Canada's mine production of silver is expected to decline during the next few years because of ore reserve depletion at a number of operations, including the Gibraltar copper mine in British Columbia, the Gaspé copper mine in Quebec, and the Heath Steele lead-zinc mine in New Brunswick. Production will likely stabilize around 1150 t/y before increasing in the future as base-metal prices recover and mines come on stream or re-open, such as the Faro lead-zinc mine in the Yukon. The world's mine production of silver is forecast to increase at a rate of about 3-4% per year into the next century with the opening of new or previously closed silver-rich gold or base-metal mines. Demand will likely continue to display a similar pace of growth as economic performance improves in Asian countries. Consumption may be further enhanced in the short to medium term if the political tension between India and Pakistan results in greater demand for silver as a store of wealth in the region.

In 1998, the supply deficit, although expected to be somewhat reduced from previous years because of additional new mine capacity, will continue to contribute to a draw-down of inventories and support the silver price, which is expected to average between US$5.00 and $6.00/oz. As inventories are further reduced in the future, primarily silver-producing mines will likely come on stream and narrow the supply deficit while providing swing capacity to moderate market fluctuations. The average annual price of silver is expected to increase and to range between $6.00 and $7.00/oz early in the next century. Silver prices may vary considerably on a daily or monthly basis in the short and medium term, depending on speculative buying and selling by fund managers and others, or if world events trigger an increase in investment demand. - ***NRCanada - 1997 Annual Review***

AVERAGE ANNUAL SILVER PRICES
1975-97

Year	United States	United Kingdom
	(US$/oz)	
1975	4.42	4.43
1976	4.35	4.35
1977	4.62	4.63
1978	5.40	5.42
1979	11.09	11.07
1980	20.63	20.98
1981	10.52	10.49
1982	7.95	7.92
1983	11.44	11.43
1984	8.14	8.15
1985	6.14	6.13
1986	5.47	5.47
1987	7.01	7.02
1988	6.54	6.53
1989	5.50	5.50
1990	4.82	4.83
1991	4.05	4.06
1992	3.94	3.95
1993	4.30	4.31
1994	5.29	5.26
1995	5.19	5.20
1996	5.19	5.20
1997	4.88	4.90

Sources: Handy & Harman; London Silver Market.

I have chosen to use:

Product	1998	1999	2000	2001	2002
Silver ($US/oz)	5.00	5.25	5.50	5.75	6.00

Other than the period form 1979-84, the price of silver has been very stable during the last 25 years. Although NRCanada has predicted prices between $6 and $7/oz early in the next century, I have chosen to increase the price gradually starting from $5 in 1998 to $6 in 2002. The reason is because of the Asian slowdown that was not anticipated when the NRCanada information was prepared.

COPPER

Longer-term Outlook, 1999-2008

Although we expect the Asian situation to stabilize by the end of this year, it will be a while before countries in the region can recapture pre-crisis rates of economic growth. We anticipate slower growth in the Western World through 2001 before recovery in the Asia and stronger performance in Latin America boost output in the later years. The faster pace of economic expansion, supported by recovery in Asia, augurs well for copper prices as consumption has been growing most rapidly in countries of that region other than Japan. The macroeconomic outlook is therefore is consistent with an initial weakening and subsequent strengthening of world copper demand and prices. It also complements the forecast supply-demand balance which indicates excess supply through 2001 and excess demand in later years to 2006. Both the economic growth profile and copper market fundamentals suggest a period of weaker prices giving way to higher prices later on. We expect copper consumption in the Western World will increase at an annual average of 3% to 15.33 million tonnes in 2008. Refined copper production , likewise, is anticipated to grow on average by 3% a year to reach 15.36 million tonnes. Although net imports will rise through 2000, a progressive decline to 2008 is forecast to set in afterwards as economic growth and consumption pick up in the former Soviet Union. Combining net trade flows with refined production, Western World supply should grow at an annual average rate of 2.5% through 2008 to 15.39 million tonnes.

The market will continue to be characterized by fairly large surpluses which are expected to average some

265,000 tons between 1999 and 2001. The growing surplus will boost stocks to 3.16 million tons in 2002. Prices, therefore, will continue to be under downward pressure over the next few years. Subsequently, deficits are projected to emerge between 2003 and 2006. Given this pattern for supply, demand and inventories, prices are expected to remain depressed through 2002 before beginning a significant upward trend in light of growing deficits and declining stocks.

Year	Base Case	Downside
1999	$0.75	$0.64
2000	$0.72	$0.61
2001	$0.74	$0.63
2002	$0.78	$0.66
2003	$1.05	$0.89
2004	$1.36	$1.16
2005	$1.50	$1.28
2006	$1.55	$1.32
2007	$1.50	$1.28
2008	$1.46	$1.24

BANK OF MONTREAL - Economics Department - Metals - March 1998

I have chosen to use:

Product	1998	1999	2000	2001	2002
Copper ($US/lb)	0.75	0.75	0.72	0.74	0.78

The article by ***BANK OF MONTREAL - Economics Department - Metals*** is a thorough and recent publication. I have chosen to use their metal price predictions as they are. Copper has the second largest impact on the NSR for Heath Steele resources.

LEAD

Western World lead consumption in 1997 was essentially unchanged from 1996, but is expected to increase by about 2% as Asian economies recover during 1998. However, growth in Western World demand will likely again be outstripped by rising production and net exports from Eastern countries. In the absence of unforeseen production cuts or disruptions, such as start-up difficulties at new or expanding mines or smelters, it is expected that rising stocks will place downward pressure on prices, which are forecast to range between US21¢ and 29¢/lb in 1998. Prices may be further suppressed if demand softens as the result of continued sluggish economic growth in Southeast Asia or a weak replacement battery market resulting from mild climatic conditions.

In the long term, lead demand is expected to maintain an average growth rate of 1.0-1.5%/y into the early part of the next century. The battery sector will account for most of the growth, with the newly industrialized nations of Southeast Asia expected to record the most rapid growth as the vehicle population expands. Greater secondary output and primary production from new and re-opened mines will likely continue to surpass demand and place downward pressure on prices in the medium term, but they should recover in the long term as demand increases and range between US24¢ and 30¢/lb in constant 1996 dollars. In 1998, Canadian mine output of lead is forecast to increase to 195 000 t as newly re-opened mines complete a full year of production. In the long term, it is expected that production will rise as new mines, such as Cominco's Kudz Ze Kayah project, and previously closed operations (e.g., Sa Dena Hes) come on stream. However, output may again decline early in the next century unless additional reserves are found at existing mines or through new discoveries. New smelting capacity is expected to contribute to Canada's lead metal production reaching an annual record high of about 350 000 t in 1998. ***NRCanada - 1997 Annual Review***

I have chosen to use:

Product	1998	1999	2000	2001	2002
Lead ($US/lb)	0.24	0.23	0.25	0.26	0.27

The lead price has the smallest impact on the NSR for Heath Steele resources. The Asian economies have not yet recovered and a build up of inventory is occurring. The price for 1999 will probably remain weak in the $0.23/lb range then gradually improve to more historical levels of $0.26-$0.27/lb through 2002.

Exchange Rate

The economic feasibility of any additional mining at Heath Steele Mines is also affected by the Canadian Dollar exchange rate. Predictions of future exchange rates is difficult and dependent on many factors. The Canadian exchange rate is affected more by external factors than internal fiscal policy. At present the weakness is related mostly to the weakness of the Asian Economies because our resource based economy and its dependence on the Asian markets. Our dollar is also dependent upon interest rate policy in the United States. The Asian economies are expected to strengthen over the next six months but they may take years to get back to their pre-collapse economic growth rates. There are indications that the US economy has slowed and that there may be further easing of US interest rates in the next 3 months. Both of these factors should have a positive impact on the Canadian dollar exchange rate in the next 3-6 months.

In March, 1998 the Bank of Montreal made the following prediction:

With inflation remaining subdued, government deficits being eliminated, and government debt being reduced, we expect interest rates to remain low and stable and the Canadian dollar to gradually rise from an average of US $0.709 in 1998 to US $0.741 in 2001. Given that Canada's inflation record is expected to be better than that in the U.S., this represents only a modest increase in the "real" exchange rate. This environment should sustain momentum in sectors that are interest-sensitive and/or heavily dependent on domestic demand. In particular, construction -- both residential and commercial/industrial -- will likely strengthen during the next few years. Additionally, the rapid pace at which companies are implementing new technologies will keep investment in machinery and equipment growing briskly. The export-oriented sector will be adversely affected by the Asian financial crisis and an expected slowdown in the growth of US demand. Nevertheless, those sectors (and companies) which have taken steps to diversify their sales geographically will benefit from such strategies. Over the medium term, the export sector should continue to perform well as many companies have actively adopted exporting as an important element of their business strategies. ***BANK OF MONTREAL - Economics Department - Metals - March 1998***

In October 1998 the Bank of Montreal made the following 1 year forecast:

Canadian$/US Exchange Rate

Dec 1998	1.50
Mar 1999	1.52
Jun 1999	1.49
Sep 1999	1.47
Dec 1999	1.48

BANK OF MONTREAL - Economics Department - October 1998

The exchange rate has a significant impact on NSR for Heath Steele resources. Heath Steele has hedged the Canadian dollar against their production at an exchange rates of 1.43 for 1999. I am uncomfortable to predict a Canadian dollar at less than $1.43 past 2000. Canada's economy is resource based and as metal prices improve, so will the dollar. As Asian economies improve, so will the dollar. If the US economy slows (as it is showing signs of) and US interest rates decrease, the Canadian dollar value will also improve. I believe that the Bank of Montreal - March 1998 prediction for the dollar will be more accurate over the longer-term with the dollar between $1.43 and $1.33.

APPENDIX 3
Heath Steele Mines Review
Certificate of Qualification
November, 1998

D.M. Fraser Services Inc.
Management Consultants
98 Mannington Lane, Fredericton, New Brunswick E3A 5S7 • Phone (506) 457-1027 • Fax (506) 547-1207

Certificate of Qualification

I, Donald M. Fraser, do hereby certify:

That I am and have resided at 98 Mannington Lane, Fredericton, New Brunswick since 1996.

That I am a management and mining consultant and have practised consulting since 1988 in Fredericton, New Brunswick.

That I am a graduate of Queen's University and hold a Bachelor of Science with Honours in Mining Engineering (1974) from this university.

That I am a graduate of the University of Western Ontario and hold a Master of Business Administration (1984) from this university.

That I am a registered Professional Engineer in the Province of New Brunswick, number 2281 and have been a member of the APENB in good standing since 1977.

That I have worked for more than 20 years in the mining industry in Canada.

That the accompanying analysis was prepared by me and is based on geological information, cost information and mine planning information gained from Heath Steele Mines personnel. I visited the property in October 1998 and was underground at the property in 1996.

That I do not hold nor do I expect to receive any interest or security in Heath Steele Mines, Brunswick Mines, Noranda Mines or related companies, nor do I hold nor have I been promised benefits from the above companies.

Dated at Fredericton this
14th day of November, 1998

Donald M. Fraser

Donald M. Fraser, P. Eng., MBA

APPENDIX 4

Heath Steele Mines Review

National Policy Statement No. 2-A

Reserve Classification Definitions

November, 1998

The following definition of resources has been taken from National Policy Statement No. 2-A and are summarized below.

"Ore" means a natural aggregate of one or more minerals which, at a specific time and place, maybe mined and sold at a profit, or from which some part may be profitably separated;

"proven ore" means the material for which tonnage is computed from dimensions revealed in outcrops or trenches or underground workings or drill holes and for which the grade is computed from the results of adequate sampling, and for which the sites for inspection, sampling and measurement are so space and the geological character so well-defined that the size, shape and mineralized content are established, and for which the computed tonnage and grade judged to be accurate within limits which shall be stated and for which it shall be stated whether the tonnage and grade of proven ore are 'in situ' or extractable, with dilution factors shown, and reasons for the use of these dilution factors clearly explained;

"probable ore" means that material for which tonnage and grade are computed partly from specific measurements, samples or production data, and partly from projections for a reasonable distance on geological evidence, and for which the sites available for inspection, measurement and sampling are too widely or otherwise inappropriate spaced to outline the material completely or to establish its grade throughout;

"possible ore" means that material for which quantitative estimates are based largely on broad knowledge of the geological character of the deposit and for which there are few, if any, samples or measurements and for which the estimates are based on an assumed continuity or repetition and for which there are reasonable geological indications, which indications may include comparison with deposits of similar type, and bodies that are completely concealed may be included if there is specific evidence for their presents, and

- *i) estimates of "possible" ore shall include a statement of conditions within which the inferred material occurs, and*
- *ii) since the arithmetic average of any amount of sampling is not necessarily representative unless the distribution of values and numbers of samples are properly taken into account, a statement of how samples were taken shall be given, and where mineralization is erratic, the method of treating erratic values shall be given in the narrative of the report,*
- *iii) possible or inferred reserves must not be added to other categories of reserve and their inclusion is not acceptable in any economic analysis or feasibility study of a project.*

Where the word "ore" may not properly be used, such terms as "mineralization", "mineralized bodies" or "concentrations", etc. should be used.